

WHAT IS CLAIMED IS:

- Sub B1/
- 5 1. A method of treating a subterranean formation by injecting down a well an aqueous fluid comprising a thickening amount of a viscoelastic surfactant comprising providing a breaking system - or a precursor of a breaking system - that causes a reduction in viscosity of the fluid after its injection but does not significantly impact its viscosity at surface and during the injection.
- 10 2. The method of claim 1 comprising providing a precursor that releases a breaking system by at least one of the following process: melting, slow dissolution, reaction with a compound present in the fluid or added to the fluid during or after the step of injecting, rupture of an encapsulating coating and de-adsorption of a breaking agent absorbed into solid particles.
- 15 3. The method of claim 2, wherein said breaking system is selected among at least one of the following salts: ammonium persulfate, potassium chloride, sodium hexafluorophosphate and sodium salicylate and wherein said salts are provided under an encapsulated form.
- 20 4. The method of claim 2, wherein said breaking system is a by-product of the reaction of resin-coated proppant.
- Sub B2/ 5. The method of claim 2, wherein the breaker system comprises alcohol released from a precursor consisting of at least one of the following: an ester, a carboxylate anion, organic sulfate based salts, and sodium dodecyl sulfate.
6. The method of claim 1, wherein the breaking system comprises a carboxylic acid.
7. The method of claim 6, wherein the viscoelastic surfactant is a zwitterionic surfactant and the breaking system is citric acid.
- 25 8. The method of claim 2, wherein the breaker system comprises a carboxylic acid released from a precursor comprising a carboxylate anion, said released being performed after lowering of the pH of the viscoelastic surfactant fluid through hydrolysis of an ester.

9. The method of claim 2, wherein the breaking system is released by melting a precursor, said precursor consisting of at least one of the following: a C<sub>12</sub> to C<sub>18</sub> alcohol, alkyl amines, alkanes, alkenes, aromatics and mixtures thereof.
10. The method of claim 2, wherein the viscoelastic surfactant is anionic and/or cationic and the breaking system is released by dissolution of at least a surfactant having hydrophilic headgroups oppositely charged to the hydrophilic headgroups of the anionic or cationic surfactants of the viscoelastic surfactant fluid.
11. The method of claim 5, wherein the breaking system is at least one of the followings: an alkyl sulfate, an ether sulfate, an alkyl halide, a carboxylic acid, a carboxylic acid salt, an alkyl phosphate, an aryl phosphate or mixture thereof.
12. The method of claim 11, wherein said breaker is a C<sub>18</sub> to C<sub>20</sub> alkyl sulfate or mixture thereof.
13. The method of claim 9, wherein the breaking system is released by slow dissolution and is at least one of the followings: alkyl amines; alkanes, alkenes and aromatics.
14. The method of claim 13, wherein the breaking system is dodecyl amine.
15. ~~15. The method of claim 1, wherein the breaker system or the precursor of the breaker system is provided in the form of nanoparticles.~~
16. ~~The method of claim 1, wherein the breaker system comprises alcohol.~~
17. ~~The method of claim 16, wherein said alcohol is methanol or ethanol.~~
18. The method of claim 1, wherein the breaking system reduces low shear viscosity.
19. ~~The method of claim 18, wherein the breaking system does not substantially reduce high shear viscosity.~~
20. ~~The method of claim 18, wherein the breaking system is added to the viscoelastic fluid during the pad or the pre-pad stage.~~

21. The method of claim 19, wherein the breaking system is added to the viscoelastic fluid during the pad or the pre-pad stage.

112<sup>5</sup> → ~~22. A method of treating a subterranean formation by first injecting, down a well, a solid-free aqueous fluid comprising a thickening amount of a cationic viscoelastic surfactant and an alcohol, selected among methanol and alcohol, and then, a proppant-containing aqueous fluid comprising a thickening amount of said cationic viscoelastic surfactant.~~

23. The method of claim 22, wherein the cationic viscoelastic surfactant is erucyl methyl bis(2-hydroxyethyl) ammonium chloride.

10 24. The method of claim 1, wherein said treatment consists of at least one of the following: gravel packing, hydraulic fracturing, acid fracturing and acidizing.

25. The method of claim 1, wherein said breaker is added to only a portion of said viscoelastic surfactant fluid.

15 26. The method of claim 1, wherein said viscoelastic surfactant is anionic, cationic, nonionic, zwitterionic or a combination thereof.

~~27. A composition for treating a subterranean formation comprising an aqueous fluid comprising a thickening amount of a viscoelastic surfactant and a precursor of a breaking system that causes a reduction in viscosity of the fluid.~~

20 28. The composition of claim 27, wherein the precursor of the breaking system is selected among at least one of the following salts: ammonium persulfate, potassium chloride, sodium hexafluorophosphate and sodium salicylate and wherein said salts are provided under an encapsulated form.

~~29. The composition of claim 27, wherein the precursor of the breaking system comprises resin-coated proppant.~~

25 30. The composition of claim 27, wherein the precursor of the breaker system comprises at least one of the following: an ester, a carboxylate anion, organic sulfate based salts, and sodium dodecyl sulfate.

31. A composition for treating a subterranean formation comprising an aqueous fluid comprising a thickening amount of a zwitterionic surfactant and citric acid.

32. The composition of claim 27, wherein the precursor of the breaker system comprises a carboxylate anion.

33. The composition of claim 27, wherein the precursor of the breaking system comprises at least one of the following: a C<sub>12</sub> to C<sub>18</sub> alcohol, alkyl amines, alkanes, alkenes, aromatics and mixtures thereof.

34. The composition of claim 27, wherein the viscoelastic surfactant is anionic and/or cationic and the precursor of the breaking system is a slow-soluble surfactant having hydrophilic headgroups oppositely charged to the hydrophilic headgroups of the anionic or cationic surfactants of the viscoelastic surfactant fluid.

35. The composition of claim 27, wherein the precursor of the breaker system is provided in the form of nanoparticles.

36. The composition of claim 27, wherein the cationic-viscoelastic-surfactant is erucyl methyl bis(2-hydroxyethyl) ammonium chloride.